

WHAT IS CLAIMED IS:

- 2 1. A microfluidic device for assaying a liquid biological sample of 20 μ L or
less comprising:
- 4 (a) an inlet port for receiving said sample;
- (b) a capillary passageway in fluid communication with said inlet port;
- 6 (c) an inlet chamber in fluid communication with the capillary passageway of
(b), thereby permitting said sample to flow into said inlet chamber, said inlet chamber
8 containing means for uniformly distributing said sample across said chamber and,
displacing air from said chamber; and
- 10 (d) at least one vent passageway for removing air displaced by said liquid
sample.
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2. A microfluidic device of Claim 1 wherein said means for uniformly
14 distributing said sample is at least one groove extending across said inlet chamber.
- 16 3. A microfluidic device of Claim 1 wherein said means for uniformly
distributing said sample is at least one weir extending across said inlet chamber.
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4. A microfluidic device of Claim 2 or 3 wherein said at least one groove or
20 at least one weir contains wedge-shaped cutouts to facilitate uniform flow of said
sample.
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5. A microfluidic device of Claim 1 wherein said means for uniformly
24 distributing said sample is a microstructure comprising an array of posts disposed across
said inlet chamber.
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6. A microfluidic device of Claim 5 wherein said posts contain wedge-
28 shaped cutouts to facilitate uniform flow of said sample.
- 30 7. A microfluidic device of Claim 1 wherein said inlet port is tapered to
engage the corresponding shape of a pipette for depositing said sample
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8. A microfluidic device of Claim 1 further comprising an blood anti-
34 coagulant deposited in said inlet chamber.

2 9. A microfluidic device of Claim 1 further comprising an overflow chamber
in fluid communication with said inlet chamber, said overflow chamber for receiving
4 said sample in excess of the amount needed to fill said inlet chamber.

6 10. A microfluidic device of Claim 9 wherein said overflow chamber contains
an indicator to detect the presence of excess of said sample.

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 11. A method of supplying liquid to a microfluidic device having an inlet port
10 in fluid communication with an inlet chamber via a capillary passageway, said method
comprising.

12 (a) introducing a portion of said liquid into said inlet port;
 (b) transferring by positive pressure or capillary forces said liquid portion of
14 (a) to said inlet chamber via said capillary passageway;
 (c) distributing said liquid portion of (a) uniformly across said inlet chamber
16 and purging air from said chamber completely.

18 12. A method of Claim 11 wherein excess of said sample is diverted to an
overflow chamber after said inlet chamber is filled.

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 13. A method of Claim 12 wherein the presence of said excess is detected by
22 an indicator in said overflow chamber.